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Wildlife viewing is becoming one of the most popular forms of outdoor recreation in America. Observing wildlife in one's own backyard is not only enjoyable, but convenient as well. In some areas (especially rural settings), excellent wildlife habitat exists and viewing opportunities can be abundant. However, in a growing number of areas (especially suburbia), wildlife habitat has deteriorated or been destroyed entirely. This is particularly true in many subdivisions where the landscape was bulldozed and leveled-off prior to home construction. In either case, there are lots of ways to improve wildlife habitat around your home.

## Wildlife Needs

Wildlife have four basic requirements: food, cover, water and space. Considering these requirements, you can see where the area around your home may be deficient in one or more of these. In most cases you can improve deficiencies; however, in some cases, because of physical or spatial limitations, you will not. These four basic habitat requirements differ (to some degree) with each wildlife species. What is good for one species may not be good for another. For example, squirrels will not get much benefit from a large lawn or pasture where bluebirds are thriving on insects. Also, some mammals (e.g., deer and bears) need a much larger area to meet their habitat requirements than others (e.g., rabbits or chipmunks) do. There is, however, overlap in many habitat requirements. Many wildlife species benefit from a fruit-producing shrub or bird feeder and a multitude of species will use the standing dead oak at the edge of your yard or field for nesting, denning, roosting, perching and feeding.

## Wildlife Management Concepts

Before starting a plan to improve wildlife habitat around your home, there are some basic concepts of wildlife management you should understand. Realizing that not all species have the same habitat requirements, a diversity of habitats and vegetative types will benefit more wildlife species than an area with homogenous vegetative cover. Increased plant diversity gives rise to increased animal diversity, where diversity is the number of species, not the number of individuals. Food, cover, water and space

resources are finite and can be utilized completely. To this end, an area can support only so many animals, which is expressed as the carrying capacity (Figure 1). In many areas, the carrying capacity has been reached, yet no animals are present! That is because there is insufficient habitat to support any wildlife. This is where activities for improvement are much needed and results can be astonishing.

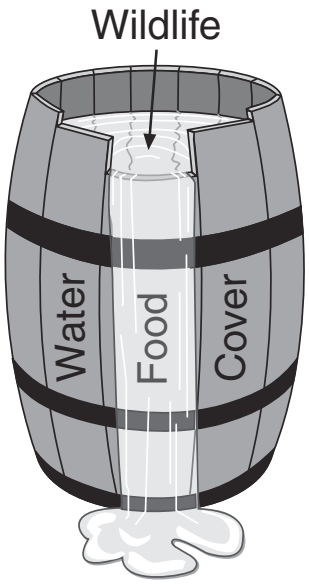



*Figure 1.*

## Edge, Vertical Structure and Interspersion

"Edge" is where two or more habitats come together. For example, an edge exists where your yard meets the woodlot. Most often, many wildlife species are found here. The reason these species are associated with edges is because both food AND cover are in close proximity. Escaping a hawk or house cat is much easier for a rabbit if some brushy cover is near the clover and grass it's feeding on. Likewise, a fox is going to hunt most often where the rabbit is — near the "edge!" Creating an irregular border (as opposed to a straight one) with your yard and ornamental plantings is the easiest way to increase the amount of edge near your home (Figure 2).

*Figure 3. Edge is increased vertically by "stair stepping" vegetation starting with low-growing herbaceous vegetation, then shrubs, small trees and large trees.*

Edge is represented on both a horizontal and vertical plane. Vertical structure is represented by different layers of vegetation extending from the ground up to the tree canopy (Figure 3). Vertical structure is important for several reasons. Most importantly, it represents different layers of cover for protection, nesting, roosting and feeding for all kinds of animals

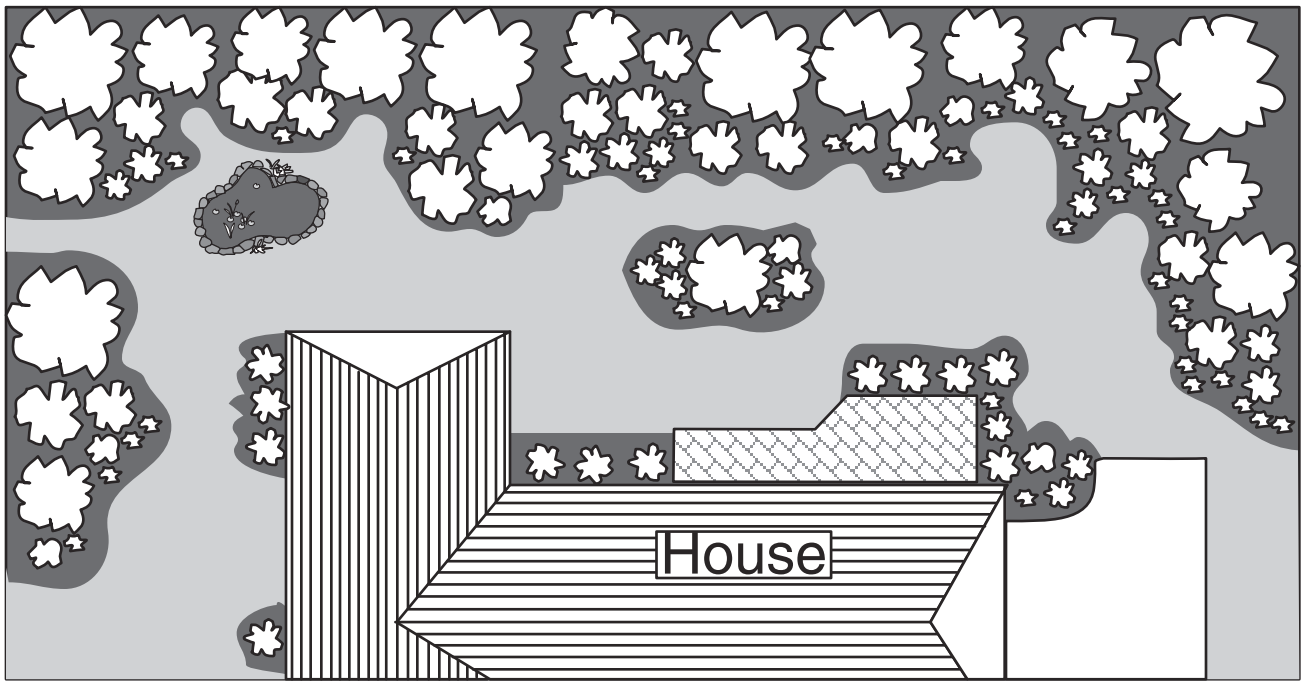



*Figure 2. You can increase the amount of edge by creating irregular borders.*

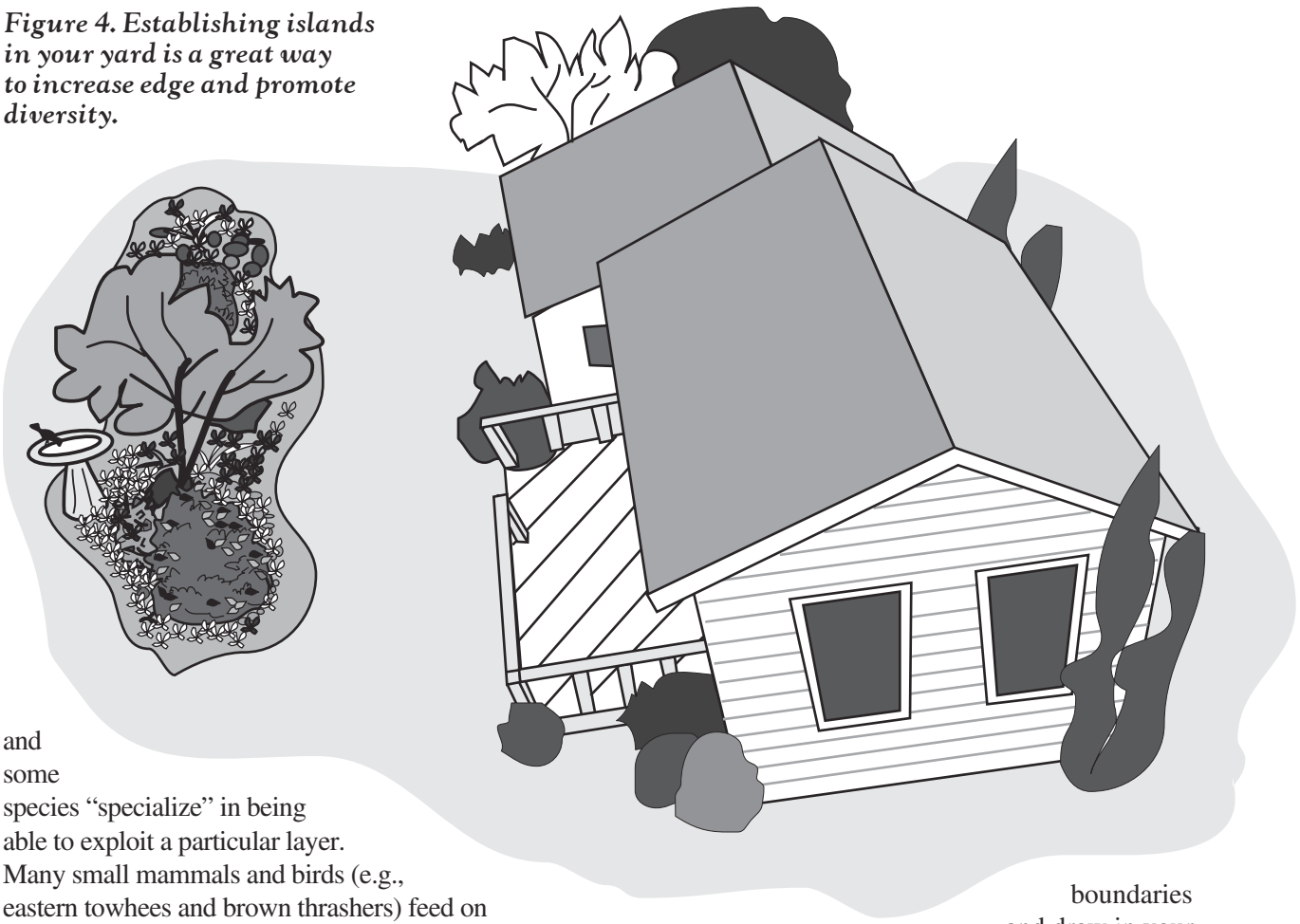


*Figure 4. Establishing islands in your yard is a great way to increase edge and promote diversity.*

and some species "specialize" in being able to exploit a particular layer. Many small mammals and birds (e.g., eastern towhees and brown thrashers) feed on the ground amongst brush and low vegetation. Carolina wrens, northern cardinals and northern mockingbirds forage for food in low-growing shrubs and trees. Red-eyed vireos, scarlet tanagers and yellow-throated warblers forage in the canopy of mature stands. Some species (e.g., wild turkeys) prefer areas where visibility is good and the vegetation is not too dense. Others (e.g., rabbits) prefer areas with low-growing dense vegetation and reduced visibility.

Interspersion is best described as the arrangement of habitats. A mixture of habitats arranged in a patchwork mosaic provides good interspersion. Make your yard and surrounding area more attractive for wildlife by arranging different habitats close to one another. An island of wildflowers or shrubbery in your yard increases interspersion while breaking up large expanses of grass (Figure 4).

# Draw a Map

One of the first steps in providing increased habitat for wildlife in your backyard is to draw a map of the area surrounding your home (Figure 5). As accurately as you can, start with your property boundaries and draw in your house, driveway, fence, shed and then your shrubbery. Continue by identifying the location of all trees, bushes, bird feeders, birdbaths, etc. Once completed, step off distances (e.g., from house to road, shed to garden, etc.) to get a rough check of your map and correct any sign of errors regarding scale. Now, what do you have? Look at the habitat "holes" on your map and study the arrangement of vegetation. This will help you see where you should begin working.

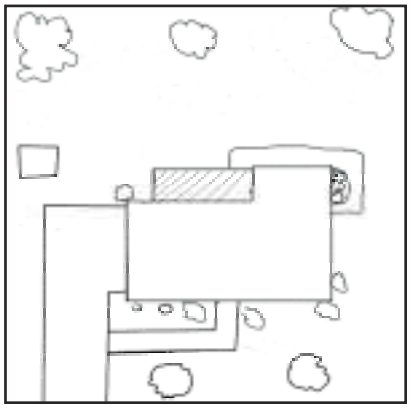


*Figure 5. Drawing of a backyard.*

# Putting It All Together

Although every area is unique, most backyards need more wildlife-friendly plants arranged to increase interspersion and edge. Planting trees, shrubs and herbaceous plants that are beneficial to wildlife usually is the single most important thing you can do to improve wildlife habitat around your home. Planting suitable plants in the appropriate places in the proper arrangement will benefit wildlife throughout the year. Food, cover and, to some degree, space will be provided automatically.

As you develop a plan to landscape your area for wildlife, keep edge and interspersion in mind. If you are starting from scratch, consider planting the tallest trees along the outside border of your yard and continue in toward the center of your yard in a stair-step fashion with smaller trees, then large shrubs, small shrubs and finally herbaceous plants (see Figure 3) . If woods already surround your house, consider planting smaller trees and shrubs at the edge of your yard and the woods, creating what is called a "soft" edge. That is, the transition between the woods and your yard is gradual, not sudden. This makes the area attractive to many more species of wildlife. Remember that a diversity of vegetation gives rise to a diversity of wildlife.

# Benefits of Landscaping for Wildlife

Many benefits are realized when landscaping for wildlife. Obviously, wildlife will benefit from habitat enhancement, but you will benefit as well. By landscaping for wildlife, you can benefit by conserving energy and reducing your heating and cooling bill (Figure 6). Plant conifers as a windbreak on the north and west sides of your property to protect from chilling winter storms. Evergreen trees and shrubs act as insulators for birds and mammals, protecting them from bitter winds and freezing precipitation. Foraging spots often can be found under evergreens when snow covers the surrounding area. On the south side of your property, plant deciduous trees that produce plenty of shade for a cooling effect in the summer. During winter, these trees will lose their leaves and

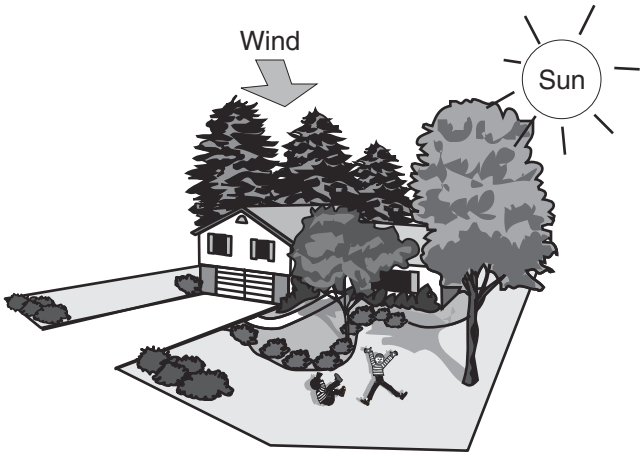



***Figure 6. Planting the correct species in the proper arrangement can help conserve energy.***

allow the sun's warming rays to reach your home and help reduce your heating bill. Soil conservation also is realized by landscaping for wildlife. Bird-watching and photographic opportunities are greatly increased by landscaping in a wildlife-friendly manner. Further, what better place is there to raise your children than one in which they can observe wildlife and learn about the natural world in their own backyard? In addition, the beauty created by your landscaping efforts may increase the value of your home and property.

# What Should You Plant?

First, consider planting trees and shrubs native to Tennessee because native species are well adapted to the soils and climate of our area (Table 1). There is less risk in native plants succumbing to drought and disease (except for exotic diseases) and they usually require less cultural attention than exotic species. Second, be aware of each plant species' requirements for sunlight, soil type, moisture and pH. Contact your county Extension agent for help concerning site requirements if you are not sure.

When deciding which species to plant, keep in mind the year-round needs of wildlife. Plants that benefit wildlife most in spring and summer may not benefit wildlife in fall and winter. Be sure to plant a variety of species that will benefit wildlife during all seasons. Foods most often consumed by birds and small mammals during spring and summer include soft mast (i.e., soft fleshy fruits, e.g., drupes, berries and pomes), invertebrates (e.g., beetles, bugs, worms, snails and flies), leafy greens and tender shoots of rapidly growing twigs. These foods are relatively high in protein and minerals, both of

which are needed during this time of year when many animals (particularly the young) are growing rapidly.

As fall and winter arrive, many wildlife species seen around the house in spring and summer disappear, either hibernating or migrating to warmer, more hospitable places. For those that stay, fall and winter present difficult challenges, such as finding shelter from harsh weather and high-energy food. Foods relished during the fall and winter seasons include hard mast (i.e., acorns and nuts), seeds, twigs, bulbs, invertebrates and cool-season grasses and legumes. Foods high in carbohydrates and fat are at a premium during winter, as an animal's energy reserves are depleted through cold winter months. Selected trees and shrubs deserving consideration when landscaping for wildlife habitat improvement around your home are listed in Table 1.

A wide variety of herbaceous plants are used by wildlife. Most of the herbaceous vegetation around homes, other than lawn grasses, is comprised of ornamental plantings, often including exotic flowering species. Many flowering herbaceous species can be planted specifically to attract hummingbirds and butterflies. When planting ornamentals for cover, keep the concept of vertical structure in mind. More wildlife species will benefit if herbaceous plants are arranged to provide a "soft" edge. Holistically, herbaceous plants around your yard benefit wildlife more as a source of cover than forage, though some species, especially white-tailed deer and rabbits, may browse these plants. Herbaceous species you can use to attract hummingbirds and butterflies are listed in Table 2.

# Providing Shelter

In addition to landscaping for food and cover, there are more possibilities to consider. When you finish limbing and pruning work around the house or cutting up storm damage, pile the material adja-

cent to a nearby woodlot. Brushpiles are magnets for lots of birds (foraging for insects), small mammals (e.g., rabbits and chipmunks) and reptiles (yes, this includes snakes!). To construct a brushpile for wildlife, place the largest limbs (or logs) on the bottom and pile the smaller brush on top in a loose fashion (Figure 7). This provides dens and crevices for wildlife under the protection of brushy cover. If you do not have any large limbs or logs, you can pile smaller brush on top of sections of corrugated pipe. After the holidays, your Christmas tree makes a wonderful addition to the top of the brushpile. As you tend your garden in the spring, instead of throwing rocks wildly into adjacent brush or woods, create a rockpile. Many species (e.g., chipmunks, foxes, rabbits, raccoons and snakes) will benefit from your effort.

Additional habitat for many species of birds, mammals, reptiles and amphibians is provided by cavities in trees, particularly dead, standing trees (called snags; Figure 8). These structures provide nesting, denning and roosting sites for species such as bluebirds, owls, wrens, flycatchers, wood ducks, nuthatches, chickadees, swallows, titmice, woodpeckers, vultures, black bears, squirrels, raccoons, bats, black rat snakes and garter snakes. Snags also serve as perching sites for eagles, hawks, owls, vultures, herons and kingbirds and feeding sites for brown creepers, nuthatches, kingbirds, woodpeckers, gnatcatchers, lizards, skinks and treefrogs. Unless the snag is a potential hazard to your home or other structural property, let it stand and watch what happens. You will be amazed at how many wildlife residents and visitors it receives.

*Figure 8. Standing dead trees (snags) attract many species of wildlife.*

# Feeders and Nest Boxes

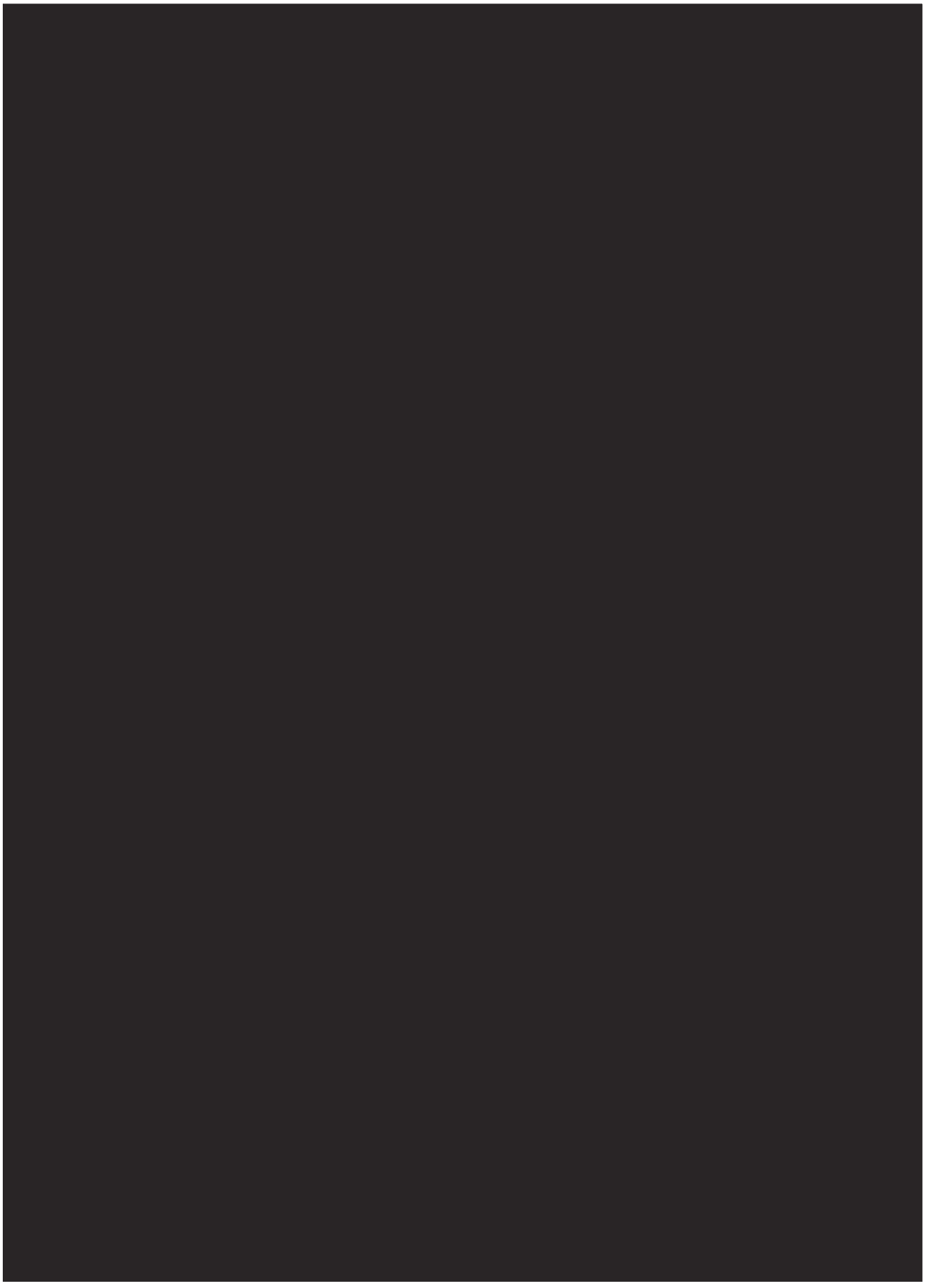
In addition to planting trees and shrubs that produce food and cover for wildlife, feeders and nest boxes can be placed throughout your property to further provide for wildlife around your house. Much has been written concerning backyard feeders and nest boxes, with many designs and varieties available. For comprehensive information on feeding birds and feeder designs, refer to *Wild about Birds* by Carrol Henderson, available through the Minnesota Department of Natural Resources (800) 657-3757 or (612) 297-3000. Detailed information on nest boxes and other nesting structures and how to construct them is provided in *Woodworking for Wildlife: Homes for Birds and Mammals,* also by Carrol Henderson. A version adapted for Tennessee is available through the TWRA and is titled, *Woodworking for Wildlife in Tennessee*, and is available by contacting the Tennessee Wildlife Resources Agency, (800) 262-6704.

**Figure 7. Brushpile designed for wildlife.**

Whichever type of feeder(s) you use, there are some key points to consider. First, there is no best or worst time to begin feeding; however, if you begin a feeding program in the fall/winter months, continue until spring. Wildlife around your house will begin to depend on the food provided—that is why they are there! You can continue feeding wildlife throughout the year if desired. Another point to keep in mind is to beware of house cats! They are extremely proficient predators and can severely reduce the number of birds and small mammals around your house. Research has shown that house cats (both feral and pets) kill hundreds of thousands of birds and untold numbers of mammals each year. In many cases, the prey is not consumed, only killed because of the cat's innate sense to hunt. If you have a cat, consider keeping it inside and/or putting a bell on its collar. All feral cats seen in your area should be reported to your local animal shelter for immediate capture and removal. Otherwise, you are doing a disservice to our native wildlife populations. House cats (whether feral or not) are NOT natural predators; they are exotic animals, not native to North America.

You can cater to the species you prefer by using selective feeder designs and seeds. Most birds will eagerly consume black oil-type sunflower seeds and white proso millet and all can feed from platform and fly-through feeders (Figure 9). Put out several different types of foods — part of the fun is finding out who will eat what! Don't forget to try suet feeders, thistle, fruit halves nailed to a tree or post, peanut butter smeared on the side of a tree and old breads and cakes. This should ensure a diversity of birds around your home. Feeders should be cleaned periodically with hot, soapy water fortified with a capful of disinfectant (10 percent bleach); rinse well. Bottoms of feeders should have small holes drilled in (if they are not screen bottoms) to facilitate moisture evaporation and reduce mildew. If you enjoy watching wildlife visiting your feeders, be sure to place them in view of a window or glass sliding door. However, remember sites under feeders may be very messy with spilled seeds and droppings, which can attract mice and rats. Hence, your back porch or patio may not be the best place for a feeder. Listed in Table 3 are foods preferred by birds that frequent backyard feeders in Tennessee.

European starlings are especially attracted to peanut hearts, so you may not want to offer them at your feeders. Also, note that it is legal to kill exotic bird pests such as starlings and house sparrows. If you consider squirrels a problem at bird



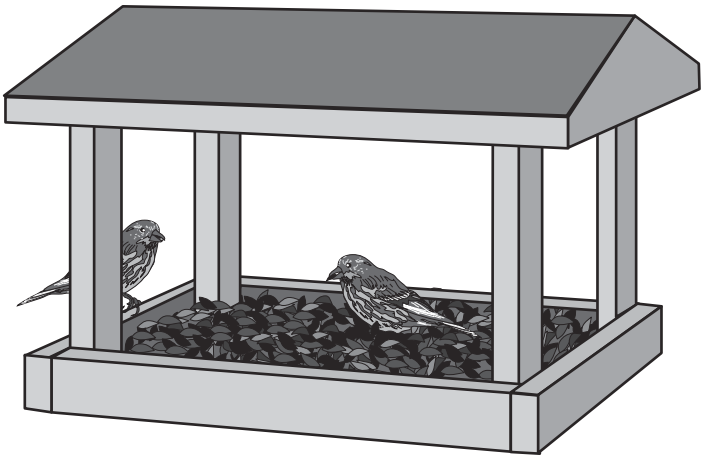


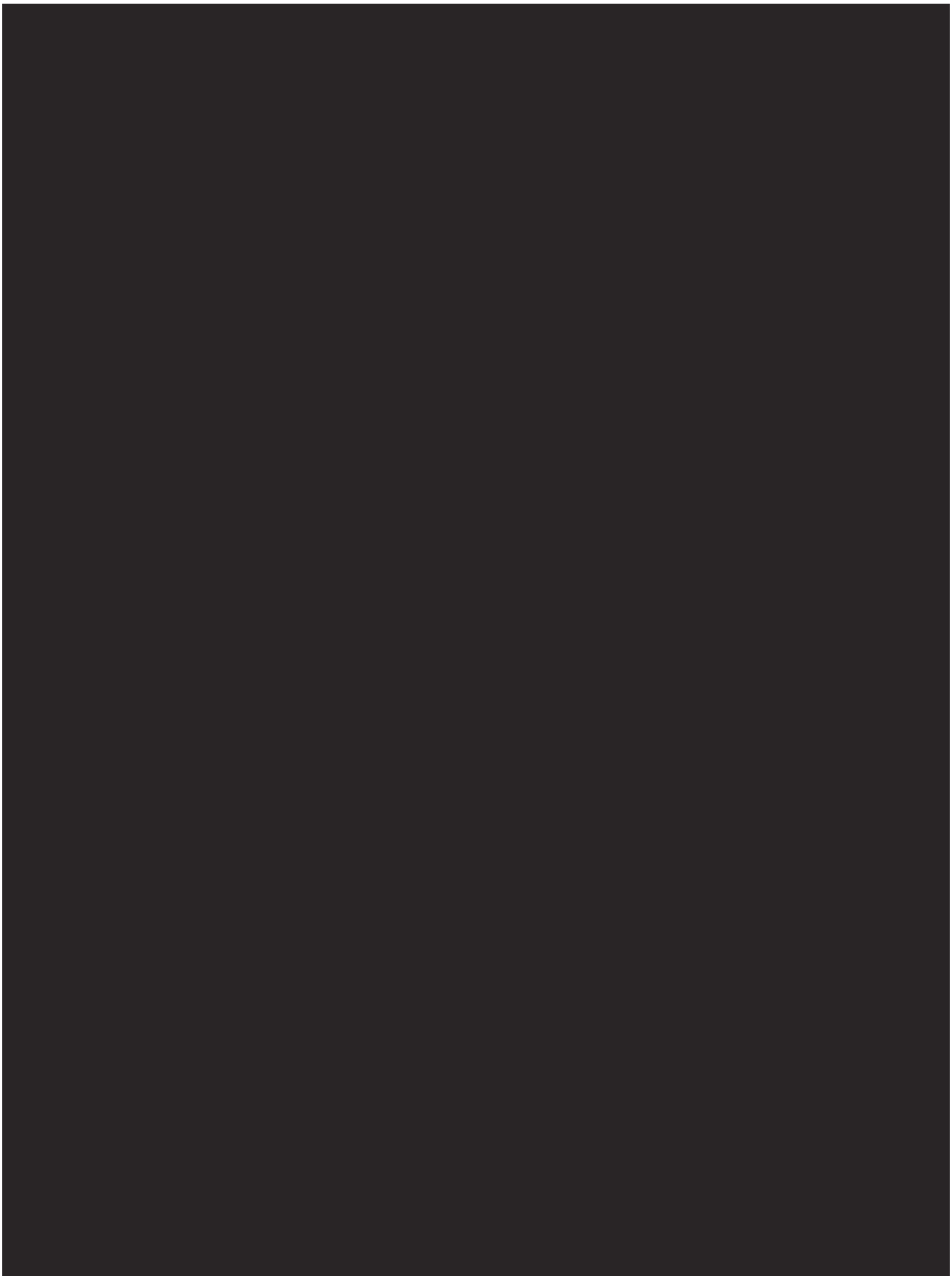
***Figure 9. Fly-through feeders are popular with many people and attract many different bird species.***

feeders, provide them with some food of their own. Unshelled (left on the cob) corn skewered on a long nail driven into a tree or post sometimes will keep their attention away from the bird feeder. If not, "squirrel-proof" feeders are available commercially or you can use your imagination in "squirrel-proofing" your bird feeder. (Hint: metal flashing or vinyl siding wrapped around the feeder post usually works. Good luck matching wits; squirrels are quite ingenious at getting to feeders!)

Hummingbirds require a special type of feeder. Hummingbird "nectar" is four parts water to one part sugar. It is best to boil water before adding the sugar so it will dissolve well. If you make relatively large quantities of this solution, store unused portions in the refrigerator. Hummingbird "nectar" should not contain honey because of the risk of fungal diseases. You can feed hummingbirds as long as they visit the feeder. You will NOT keep hummingbirds from migrating by keeping feeders out past Labor Day. Also, there is no evidence that putting red food-coloring dye in the solution harms hummingbirds, however, since the safety of food-coloring dye is in question, it may be best not to use it in "nectar." Most hummingbird feeders are colored red to attract the birds so food-coloring dye is not needed anyway. If your feeder does not have any color, you can paint a red flower or put red tape around the feeder. CAUTION: sugar water will ferment when left in the hot sun. Fermented nectar is deadly for hummingbirds. Do not put out a hummingbird feeder if you are not willing to clean it weekly. Wash hummingbird feeders using hot water with a little vinegar added to discourage mold. Hummingbird feeders should be scrubbed with a bottlebrush and rinsed thoroughly before refilling with "nectar." If insects are attracted to your hummingbird feeder, don't despair; in addition to nectar, hummingbirds feed upon insects for protein.

Nest boxes are another structural component important in improving wildlife habitat around your home. Although most people associate nest boxes with bluebirds, many other wildlife species (including mammals) benefit also. Species such as gray squirrels, flying squirrels, bats and screech owls will accept and use nest boxes. In fact, all of the cavity-nesting species listed previously may be found in nest boxes if dimensions are appropriate (Table 4). Nest boxes for birds should be erected in late winter, awaiting arrival of spring migrants. Nest boxes should be inspected, cleaned out and repaired if necessary before each nesting season. While it is important that nest boxes be inspected prior to the nesting season, you should not inspect the boxes once birds (or other wildlife) have begun using them. By doing so, you risk causing the birds to desert their nest and/or young. The exception to this is when unwanted, invasive species (e.g., house sparrows and starlings) use your nest boxes—in which case their nests should be destroyed. After chicks fledge, do not try to catch them, even if they are lying on the ground, seemingly helpless. The adults are nearby, waiting for you to leave and quit bothering them. It is best to leave the animals alone and let nature take its course.

For those interested in providing bats with suitable roosting sites, a new "bat house" has been designed by personnel from the Daniel Boone National Forest in Kentucky (Figure 10). These "post bat houses" reportedly are being used at a much higher rate than previous designs, as they are more like the bats' natural summer roost sites. Dan Dourson and John MacGregor of the Daniel Boone National Forest recommend placing bat houses in the following habitats: upland forest stands with an open canopy on slopes facing south or southwest; small openings along edge-habitat near ponds; along riparian zones (streams and creeks), forest roads, powerline rights-of-ways; or the edge of forest clearcuts and small forest gaps. Relatively open areas where the bat houses can receive more sunlight are preferred. Bat houses are less likely to be used when placed near homes, barns or other buildings.



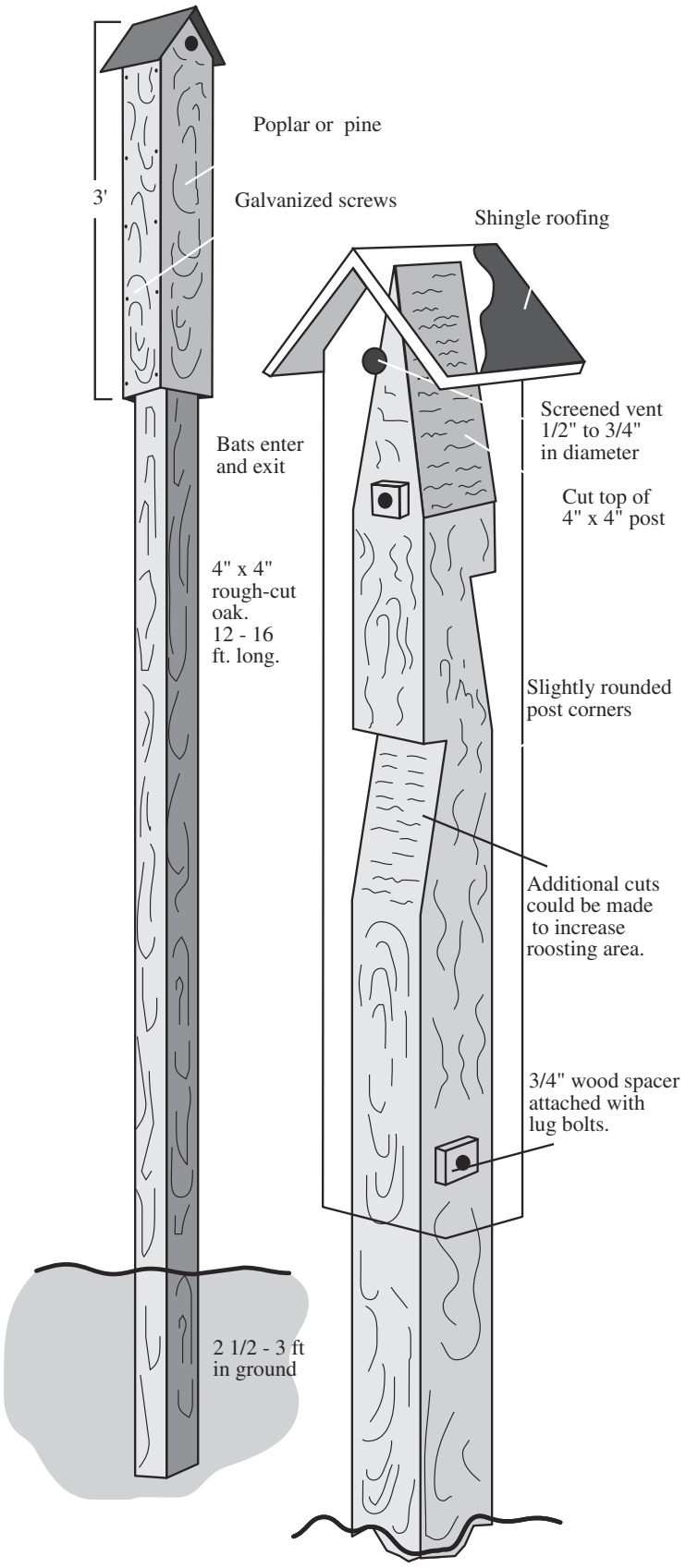



***Figure 10. "Kentucky" bat houses (or "rocket boxes") reportedly receive more use than previous designs.***

# Water

Water sources are provided in a variety of ways, ranging from a simple birdbath to a small pond created with wildlife in mind. Regardless of source, water is an essential component of wildlife habitat and provides necessities for wildlife in many ways. Obviously water provides refreshment for thirsty animals; however, there are other benefits you may not realize. Depending on the size and nature of the water source, some wildlife species may find food there. Raccoons forage for crawdads in shallow pools and creeks; herons and kingfishers feed upon small fish; and frogs, dragonflies, whip-poorwills, tree swallows, purple martins, nighthawks and bats forage on the many flying insects found above a small pond. For some species (e.g., many frogs, toads and salamanders), water is necessary for reproduction, providing a place to lay eggs and for tadpoles to develop. In addition, some wildlife species require water for a substrate to live in (i.e., fish, many turtles, frogs and salamanders). A pond is a unique ecosystem, providing habitat for an array of wildlife species that simply would not be there otherwise and enhancing conditions for many terrestrial species.

Whether you have a birdbath, a small pond 5 feet in diameter or a $^1/_4$-acre pond, there are some things to consider and keep in mind. It is best if the water source is located in the shade at least part of the day. Water will remain cooler and not become stagnant as quickly as if it were in full sunlight all day. To make a small pool most attractive for wildlife, make sure there is some cover nearby (within about 10-20 feet). This will make the animals using the water source feel more secure and render it available to more species. Keep birdbaths at least 3 feet above ground level (for protection from cats) and have a tree or some type of perch nearby for birds. In addition, the edge and bottom of birdbaths should be rough to provide secure footing. Water depth should be shallow, especially around the edges, so birds can get in and splash about. If the edge or side of the water source is too steep, many birds will not use it. If you have a small pond, make sure part of the bank perimeter is free of tall vegetation to provide a place for birds to approach the water. Another important consideration is to keep the water flowing or moving for aeration. This can be accomplished by allowing the water to run over rocks or by positioning the water intake so

that it pours into the birdbath or pond. The sound of moving water attracts many birds and other wildlife that otherwise would not visit the pool. It is critical to keep the water in your birdbath as clean and cool as possible. Allowing water to become stagnant and filled with algae can be harmful to wildlife.

# Conclusion

Improving wildlife habitat around your home can be a very rewarding and invigorating experience. While the aesthetic, recreational and biological benefits may be most obvious, the biggest reward may be the educational experience gained by children enjoying wildlife residing in and visiting their own backyards. Many folks are limited in terms of opportunities to help conserve our wildlife resources. By working toward this effort in your own backyard you can make the area around your home more interesting and attractive, and experience the fruits of your labor through an increased abundance and diversity of wildlife around you.

**Sources for information regarding backyard wildlife management:**


Foote, L. E. and S. B. Jones. 1989. *Native shrubs and woody vines of the Southeast*. Landscaping uses and identification. Timber Press. Portland, Oregon.

*Gardening with wildlife*. Available from the National Wildlife Federation, 1412 Sixteenth St., N. W., Washington, D. C.

Henderson, C. 1987. *Landscaping for wildlife.* Minnesota Department of Natural Resources, Nongame Wildlife Program. St. Paul, Minnesota.

Henderson, C. 1995. *Wild about birds*. Minnesota Department of Natural Resources, Nongame Wildlife Program. St. Paul, Minnesota.

*Woodworking for wildlife in Tennessee*. Available from the Tennessee Wildlife Resources Agency, Ellington Agricultural Center, P. O. Box 40747, Nashville, TN 37204.